Amendments to the Claims

This listing of claims will replace the claims that were published in the PCT Application:

1. (currently amended) Method for transforming in an audio signal processor a digital audio signal ~~(X)~~ from the time domain into a different domain, said method including the steps:

- forming ~~(PAR)~~ partitions ~~(x)~~ of transform length N from said digital audio signal ~~(X)~~, which partitions overlap by N/2, wherein N is an integer multiple of '4', ~~characterised by~~ comprising:
- performing ~~(TRF)~~ a multiplication of a transform matrix Mh, said transform matrix having a size of N/2 rows and N columns, with each one of said partitions ~~(x)~~ such that succeeding transformed signal partitions ~~(y)~~ are provided,
  wherein said transform matrix is constructed in the form:

$$Mh = [a \;\; lr(a) \;\; b \;\; lr(-1*b)] ,$$

  wherein 'a' and 'b' are sub-matrices each having N/2 rows and N/4 columns and including '+1' and '-1' values only,
  and wherein said sub-matrices are linearly independent,
  whereby said transform matrix multiplication outputs N/2 output values per N input values representing a subsampling by a factor of '2', thereby forming a transformed digital audio signal.

2. (currently amended) Method for inversely transforming in an audio signal processor a transformed digital audio signal ~~(X)~~ into the time domain, which transformed digital audio signal was constructed by the steps:

- forming ~~(PAR)~~ partitions ~~(x)~~ of transform length N from an original digital audio signal ~~(X)~~, which partitions were overlapping by N/2, wherein N is an integer multiple of '4';
- performing ~~(TRF)~~ a multiplication of a transform matrix ~~(Mh)~~, said transform matrix Mh having a size of N/2 rows and N columns, with each one of said partitions (x) such that succeeding transformed signal partitions ~~(y)~~ were provided,

wherein said transform matrix was constructed in the form Mh = [a lr(a) b lr(-1*b)], wherein 'a' and 'b' were sub-matrices each having N/2 rows and N/4 columns and including '+1' and '-1' values only,

and wherein said sub-matrices are linearly independent,

whereby said transform matrix multiplication had output N/2 output values per N input values representing a subsampling by a factor of '2', thereby having formed a transformed digital audio signal,

said method including the steps:

- performing ~~(ITRF)~~ a multiplication of an inverse transform matrix invMh, said inverse transform matrix having a size of N rows and N/2 columns, with each one of said transformed signal partitions ~~(y)~~ such that succeeding inversely transformed signal partitions ~~(x')~~ of length N are provided,

  wherein said inverse transform matrix invMH is constructed by taking the left half of the inverse of a matrix

  $$\begin{bmatrix} a & lr(a) & b & lr(-1*b) \\ b & lr(-1*b) & a & lr(a) \end{bmatrix},$$

  wherein 'a' and 'b' are sub-matrices as defined above;
- assembling ~~(ASS)~~ said inversely transformed signal partitions ~~(x')~~ in an overlapping manner so as to form an inversely transformed digital audio signal ~~(X')~~, whereby said overlapping is of size N/2,

  and whereby the samples values of said inversely transformed signal partitions ~~(x')~~, or the samples values of said inversely transformed digital audio signal ~~(X')~~, or the values of said transformed signal partitions ~~(y)~~ are each scaled by multiplication with factor '1/N' or by a division by 'N' or by a corresponding binary shift operation.

3. (currently amended) Apparatus for transforming a digital audio signal ~~(X)~~ from the time domain into a different domain, said apparatus including:
- means ~~(PAR)~~ which form partitions ~~(x)~~ of transform length N from said digital audio signal ~~(X)~~, which partitions overlap by N/2, wherein N is an integer multiple of '4';
- means ~~(TRF)~~ which perform a multiplication of a transform matrix Mh, said transform matrix having a size of N/2 rows and N columns, with each one of said partitions ~~(x)~~ such that succeeding transformed signal partitions ~~(y)~~ are provided,

wherein said transform matrix is constructed in the form:

$$Mh = [a \;\; lr(a) \;\; b \;\; lr(-1*b)] ,$$

wherein 'a' and 'b' are sub-matrices each having N/2 rows and N/4 columns and including '+1' and '-1' values only,

and wherein said sub-matrices are linearly independent,

whereby said transform matrix multiplication means output N/2 output values per N input values representing a subsampling by a factor of '2', thereby forming a transformed digital audio signal.

4. (currently amended) Apparatus for inversely transforming a transformed digital audio signal ~~(X)~~ into the time domain, which transformed digital audio signal was constructed by the steps:

- forming ~~(PAR)~~ partitions ~~(x)~~ of transform length N from an original digital audio signal ~~(X)~~, which partitions were overlapping by N/2, wherein N is an integer multiple of '4';
- performing ~~(TRF)~~ a multiplication of a transform matrix ~~(Mh)~~, said transform matrix Mh having a size of N/2 rows and N rows, with each one of said partitions ~~(x)~~ such that succeeding transformed signal partitions ~~(y)~~ were provided,
wherein said transform matrix was constructed in the form Mh = [a lr(a) b lr(-1*b)], wherein 'a' and 'b' were sub-matrices each having N/2 rows and N/4 columns and including '+1' and '-1' values only,
and wherein said sub-matrices are linearly independent,
whereby said transform matrix multiplication had output N/2 output values per N input values representing a subsampling by a factor of '2', thereby having formed a transformed digital audio signal,
said apparatus including:
- means ~~(ITRF)~~ which perform a multiplication of an inverse transform matrix invMh, said inverse transform matrix having a size of N rows and N/2 columns, with each one of said transformed signal partitions ~~(y)~~ such that succeeding inversely transformed signal partitions ~~(x')~~ of length N are provided,
wherein said inverse transform matrix invMH is constructed by taking the left half of the inverse of a matrix

$$\begin{bmatrix} a & lr(a) & b & lr(-1*b) \\ b & lr(-1*b) & a & lr(a) \end{bmatrix},$$

wherein 'a' and 'b' are sub-matrices as defined above;

- means ~~(ASS)~~ which assemble said inversely transformed signal partitions ~~(x')~~ in an overlapping manner so as to form an inversely transformed digital audio signal ~~(X')~~, whereby said overlapping is of size N/2,
  and whereby the samples values of said inversely transformed signal partitions ~~(x')~~, or the samples values of said inversely transformed digital audio signal ~~(X')~~, or the values of said transformed signal partitions ~~(y)~~ are each scaled by multiplication with factor '1/N' or by a division by 'N' or by a corresponding binary shift operation.

5. (currently amended) Method according to claim 1 ~~or 2, or apparatus according to claim 3 or 4~~, wherein N equals '8'.

6. (currently amended) Method ~~or apparatus~~ according to claim 5, wherein said transform matrix has the values:

$$Mh = \begin{bmatrix} 1 & 1 & 1 & 1 & -1 & 1 & -1 & 1 \\ 1 & 1 & 1 & 1 & 1 & -1 & 1 & -1 \\ 1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 \\ 1 & -1 & -1 & 1 & 1 & 1 & -1 & -1 \end{bmatrix},$$

and said inverse transform matrix has the values:

$$invMh = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & 1 & -1 & -1 \\ 1 & 1 & 1 & 1 \\ -1 & 1 & -1 & 1 \\ 1 & -1 & -1 & 1 \\ -1 & 1 & 1 & -1 \\ 1 & -1 & 1 & -1 \end{bmatrix}.$$